C L A I M S

1. An electric motor characterized by comprising:

an armature core attached to a rotation shaft, having plural teeth radially extending in radial directions, and plural slots formed between teeth and extending along an axis direction;

a commutator provided on the rotation shaft to be adjacent to the armature core, with commutator members arranged in a circumferential direction, the commutator members being equal in number to the slots;

a first brush which slides on the commutator;

a second brush which is provided apart from the first brush by a predetermined angle in a circumferential direction, and slides on the commutator;

a third brush which slides on the commutator and is used with either the first or second brush; and

an armature coil which is electrically connected between adjacent ones of the commutator members, having a first coil wound between given ones of the slots, and a second coil, which is wound in an opposite direction to a direction of the first coil between slots existing at positions point-symmetric to the given ones of the slots with respect to a center of the rotation shaft, the armature coil being configured such that when the second brush contacts the adjacent ones of the commutator members to short-circuit the first and second coils through the second brush, the first and second coils exist at symmetric positions with respect to an axis line extending through a

center of the second brush and the center of the rotation shaft.

2. The electric motor according to claim 1, characterized in that the first and second coils are connected in series with each other.

3. The electric motor according to claim 1 or 2, characterized in that the first and second coils are connected in parallel with each other.

4. The electric motor according to claim 1 or 2, characterized in that each of the first and second coils has a main coil wound between two of the slots, and a subsidiary coil wound only along any one of the slots between which the main coil is wound.

5. The electric motor according to claim 4, characterized in that each of the main coils of the first and second coils is wound by an equal number of turns around the armature core, and each of the subsidiary coils is wound on the armature core by 0.5 turns around the armature core.

6. The electric motor according to claim 4 or 5, characterized in that the subsidiary coils are formed between the main coils of the first and second coils.

7. An electric motor characterized by comprising:

an armature core attached to a rotation shaft, having plural teeth radially extending in radial directions, and plural slots formed between teeth and extending along an axis direction;

a commutator provided on the rotation shaft to be adjacent to the armature core, with commutator members arranged in a circumferential direction, the commutator members being equal in

number to the slots;

a first brush which slides on the commutator;

a second brush which is provided apart from the first brush by a predetermined angle in a circumferential direction, and slides on the commutator;

a third brush which slides on the commutator and is used with either the first or second brush; and

an armature coil which is electrically connected between adjacent ones of the commutator members, having a first coil wound between given ones of the slots, and a second coil, which is wound in an opposite direction to a direction of the first coil between the same slots as the given ones of the slots, the armature coil being configured such that when the second brush contacts the adjacent ones of the commutator members to short-circuit the first and second coils through the second brush, the first and second coils exist on an axis line extending through a center of the second brush and the center of the rotation shaft.

8. The electric motor according to any one of claims 1 to 7, characterized in that the slots are an even number of slots not less than eight.